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Prevention

DETERMINANTS OF CHANGES IN AORTIC LATE SYSTOLIC PRESSURE AUGMENTATION OVER TIME

Poster Contributions
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Session Title: Determinants and Modifiers of Arterial Stiffness
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Background: Wave reflections arising in peripheral arteries and returning to the proximal aorta during mid-to-late systole are important determinants of LV afterload. Wave reflections are predictors of the risk of future cardiovascular events and heart failure. It is therefore important to assess the determinants of wave reflections in the general population. The aortic augmentation index (AIx) is the most widely used surrogate of arterial wave reflections. Despite multiple cross-sectional studies assessing the correlates of AIx, little prospective data exists regarding the correlates of change in augmentation index over time.

Methods: In this prospective study, we performed serial radial arterial tonometry assessments in a sub-sample of 143 adults enrolled in the population-based PREVENCION study. Subjects underwent repeated tonometry procedures at baseline and 3.18 years apart (standard deviation=0.4 years). We obtained a central pressure waveform with the generalized transfer function of the Sphygmocor device (Atcor Medical; Sydney, Australia). Central augmentation index was computed as augmented pressure / pulse pressure, where augmented pressure = second - first systolic peak.

Results: Among men (n=67), the change in AIx was predicted by abdominal obesity (Standardized beta for waist circumference=0.34; P=0.002) and impaired fasting glucose (Standardized beta =0. 24; P=0.01) and the change in heart rate (Standardized beta=-0.77; P>0.0001). Among women (n=76), the change in AIx was predicted by non-HDL cholesterol (Standardized beta = 0.36; P=0.001), C-reacitve protein levels (Standardized beta = 0.22; P=0.025), the change in mean arterial pressure (Standardized beta = 0.32; 0.001) and heart rate (Standardized beta -0.52; P<0.0001).

Conclusions: There are important gender differences in the determinants of the change in late systolic central pressure augmentation over time. The correlates of changes in pressure augmentation found in this prospective study differ from previous observations based on cross-sectional data. These results may guide intervention strategies to reduce the increase in wave reflections in future studies.